3G Cell Modem
Installation and User Guide

For BaseStation 1000 & BaseStation 3200 Irrigation Controllers in Pedestal Enclosures

June 16, 2014

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FCC Compliance Information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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Introduction

In order to remotely connect with your BaseStation 1000 or 3200 irrigation controller and take advantage of BaseManager, the controller must be able to communicate over the Internet. Using a cell modem is one option for wireless Internet communication. The cell modem sends and receives data over a wireless carrier's network.

When you choose a cell modem communication package from Baseline, we provide the cell modem hardware, the antenna, the SIM card from the wireless carrier, the firmware that activates the connection from your controller, and a 1-year subscription to a data plan with the wireless carrier.

When the controller and cell modem are ordered together, the cell modem is already installed in the enclosure, but when the cell modem is ordered after the controller is in service, you will need to complete the installation.

To install and establish communication through your cell modem, you need to perform the following tasks:

Step 1 – Assemble the antenna riser.

Step 2 – Prepare the mounting location for the antenna riser.

Step 3 – Attach the antenna riser to the pedestal.

Step 4 – Install the cell modem hardware in your BaseStation 1000 or 3200 pedestal.

Step 5 – Check the firmware version on your controller and install an update if necessary.

Step 6 – Activate your SIM card with Baseline.

Step 7 – Verify the cell modem connection in the controller.

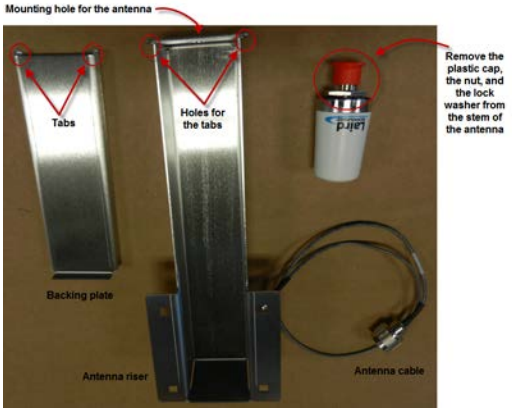
Gather the following tools and materials

- Philips head screwdriver
- Set of wrenches
- Hobby knife with a fine point and sharp blade
- Cell modem module with power cable and screws
- Antenna and antenna cable with connectors
- Ethernet cable

Step 1 – Assemble the Antenna Riser

Note: If you are not able to get a strong signal with the antenna that comes with the package, other options are available. Contact Baseline Support at 866-294-5847.

1. Remove the antenna assembly and antenna from its packaging.
2. Remove the plastic cap, the nut, and the lock washer from the stem of the antenna.
3. Put the stem of the antenna through the mounting hole on the top of the antenna riser so the antenna is positioned on top of the riser.
4. Put the lock washer onto the stem of the antenna, and then thread the nut onto the stem. Use a wrench or pliers to tighten the nut sufficiently to ensure that the antenna makes good contact with the outside of the antenna riser.


Mounting hole for the antenna
Tabs
Holes for the tabs
Remove the plastic cap, the nut, and the lock washer from the stem of the antenna
Backing plate
Antenna riser
Antenna cable

5. Thread the coax connector on the antenna cable onto the stem of the antenna and hand-tighten it. Route the antenna cable towards the bottom of the antenna riser.

6. Insert the tabs on the backing plate into the holes at the top edge of the riser and make sure the plate is snug along the back of the riser.

Step 2 – Prepare the Mounting Location for the Antenna Riser

1. Open and remove the front door on the lower part of the pedestal.
2. On the inside left wall of the pedestal, remove the nuts from the bolts that secure the cover on the outside wall. Set the nuts aside to be replaced in a later step.
3. Remove the bolts that are holding the cover on the outside wall. Set the bolts aside to be replaced in a later step.
4. Remove the cover from the outside wall, making sure that the gasket stays in place.
5. On the inside left wall of the pedestal, note the hole that is covered by the gasket.
6. On the outside left wall of the pedestal, find the location of the hole and use a sharp hobby knife to remove the gasket material that is covering the hole.

   Note: This opening is used to route the antenna cable inside the pedestal in order to connect it to the cell modem. Make the hole large enough to pass the cable through, but small enough to maintain the seal.

Step 3 – Attach the Antenna Riser to the Pedestal

1. Align the holes at the bottom of the antenna riser with the holes in the gasket at the mounting location on the outside left wall of the pedestal.
2. Feed the free end of the antenna cable through the small hole that you made in the gasket and into the inside of the pedestal.
3. Working from the outside of the pedestal, insert the bolts that you removed earlier into the four holes.
4. Working from the inside of the pedestal, thread the nuts that you removed earlier onto the four bolts. Tighten the nuts snugly.

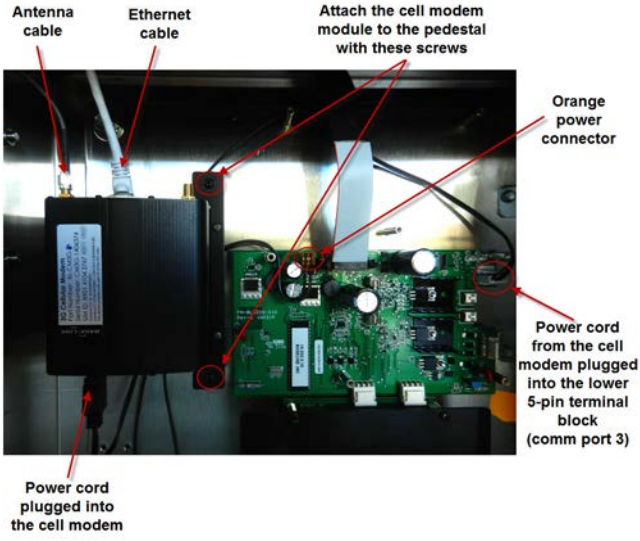
Step 4 – Install the 3G Cell Modem Hardware

IMPORTANT! The BL-CM3G cell modem hardware is compatible with all BaseStation 1000 controllers in X cabinet and pedestal (P) enclosures. BaseStation 3200 controllers in X and P enclosures shipped after April 16, 2014 are also compatible. Earlier BaseStation 3200 models require different 3G cell modem components.

1. We recommend that you back up your current configuration before starting this process in case you need to restore your system.
   - Refer to Backing Up the Controller Programming in the BaseStation 1000 User Manual.
   - Refer to Backing Up Your System in the BaseStation 3200 User Manual.
2. Halt all watering while you install the cell modem hardware.
   - BaseStation 1000: Press the **OFF** button.
   - BaseStation 3200: Turn the dial to the **OFF** position.
3. Open and remove the front door on the lower part of the pedestal.

4. Find the orange power connector on the wires coming from the transformer. Gently pull the connector away from the board to disconnect the power.

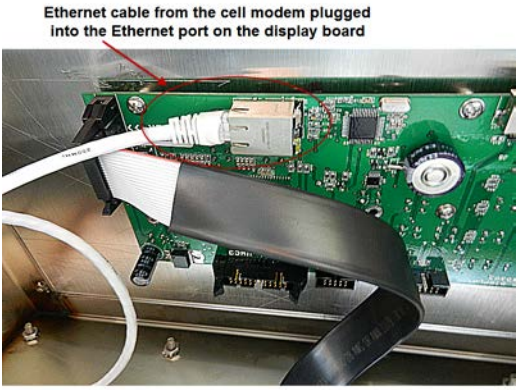
   Note: The illustration shows the black plastic dust cover removed from the controller board; however, you can install the cell modem without removing the dust cover.


Antenna cable
Ethernet cable
Attach the cell modem module to the pedestal with these screws
Orange power connector
Power cord from the cell modem plugged into the lower 5-pin terminal block (comm port 3)
Power cord plugged into the cell modem

5. Remove the cell modem hardware from its packaging.
6. Plug the power cord into the cell modem module.
7. Plug the Ethernet cable into the Ethernet jack on the cell modem module.
8. Attach the male SMA connector (small end) on the antenna cable to the connector on the cell modem module labeled WWAN Main.
9. With the antenna and Ethernet cables pointing up and the power cord pointing down, align the two mounting holes on the right side of the cell modem module with the standoffs on the back wall of the pedestal. Use the screws provided to secure the board to the enclosure.
10. Plug the 5-pin connector from the cell modem power cord into the lower 5-pin terminal block (comm port 3) on right end of the controller board.

    Note: If another connector is attached to the lower 5-pin terminal block, disconnect it, and then reconnect it to the top 5-pin terminal block.

11. Plug the other end of the Ethernet cable into the Ethernet jack on the back of the display board.
12. Reconnect the orange power connector to the board in order to restore power to the controller.
13. Reposition the black plastic cover over the controller PCA board, and then secure it with the four screws.
14. Replace the pedestal door, and then restart the controller.
    - BaseStation 1000: Press the **RUN** button.
    - BaseStation 3200: Turn the dial to the **RUN** position.



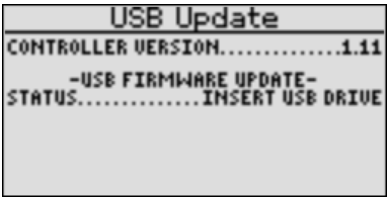
Step 5 – Check Your Firmware Version & Update if Necessary

BaseStation 1000 Instructions

BaseStation 1000 controllers running firmware version 1.11 and higher have integrated support for 3G cell modem communication. If your controller is running an earlier firmware version, you will need to download a firmware update onto a USB drive from the Baseline web site.

To check the version of firmware on your BaseStation 1000 controller

1. On the BaseStation 1000, press the **System Setup** button. The System Setup menu displays.
2. Press the ⇩ button to highlight the **Firmware Update** option, and then press the **OK** button to select it. The Firmware Update menu displays.
3. The **USB Update** option should be highlighted. If it is not highlighted, press the ⇩ button to highlight it, and then press the **OK** button to select it.



The USB Update screen displays the current firmware version at the top. If your controller is running a firmware version earlier than 1.11, you will need to download a firmware update onto a USB drive from the Baseline web site, and then install it on your controller.

To update the BaseStation 1000 firmware from the Baseline web site

You will need a computer with a USB port. This computer must have access to the Internet. You also need a USB (thumb) drive. You download the firmware from the Baseline web site to the USB drive. Then, you take the USB drive to the controller and install the update.

1. Go to the Baseline web site at the following URL:

   www.baselinesystems.com

2. On the home page, click **Support**.
3. In the left navigation bar, click **Firmware Version Updates**.
4. Click the **BaseStation 1000** tab.
5. Follow the instructions on the web page to download the update. You can also click the **Printable Instructions** link on the web page to display the instructions in a format that is suitable for printing.

BaseStation 3200 Instructions

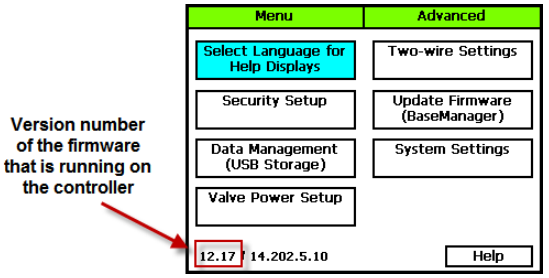
BaseStation 3200 controllers running firmware version 12.17 and higher have integrated support for 3G cell modem communication. If your controller is running an earlier firmware version, you will need to download a firmware update onto a USB drive from the Baseline web site.

To check the version of firmware on your BaseStation 3200 controller

On the BaseStation 3200, turn the dial to the **Advanced** position.

The version number of the firmware displays at the bottom of the screen.

If your controller is running firmware version earlier than 12.17, you will need to download a firmware update onto a USB drive from the Baseline web site, and then install it on your controller.



To update the BaseStation 3200 firmware from the Baseline web site

You will need a computer with a USB port. This computer must have access to the Internet. You also need a USB (thumb) drive. You download the firmware from the Baseline web site to the USB drive. Then, you take the USB drive to the controller and install the update.

1. On a computer that is connected to the Internet, go to the Baseline web site at the following URL:

   www.baselinesystems.com

2. On the home page, click **Support**.
3. In the left navigation bar, click **Firmware Version Updates**.

4. Click the **BaseStation 3200 V12** tab.
5. Click the **Printable Instructions** link on the web page to display the instructions in a format that is suitable for printing.

Step 6 – Activate Your SIM Card with Baseline

1. Fill out your information on the **Wireless Service Activation Form** that was enclosed with your cell modem communication package. This form is also available for download at www.baselinesystems.com.

   IMPORTANT! Baseline **will not activate** your SIM card **until we have received your Wireless Service Activation Form** with your **valid billing information.** Be sure to read the Wireless Service Terms and Conditions on page 2 of the Wireless Service Activation Form.

2. Fax or mail the form to Baseline. Upon receipt of the form, Baseline will activate your SIM card and then notify you. Baseline's fax number is 208.323.1834.

   Note: Please allow 2 business days after Baseline receives your Wireless Service Activation Form for your SIM card to be activated.

Step 7 – Verify the Cell Modem Connection in the Controller

After Baseline informs you that your SIM card has been activated, go to your BaseStation controller and verify that the cell modem is connected to the cellular network.

BaseStation 1000 Instructions

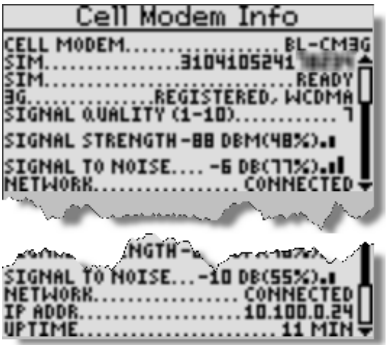
1. On the BaseStation 1000 controller, press the **System Setup** button. The System Setup menu displays.
2. Press the ⇩ button to highlight the **Network Setup** option, and then press the **OK** button to select it. The Network Setup menu displays.

   After the cell modem hardware has been installed and is powered up, the **Cell Modem Info** option displays on the Network Setup menu.

3. Press the ⇩ button to highlight the **Cell Modem Info** option, and then press the **OK** button to select it. The Cell Modem Info screen displays the following information:

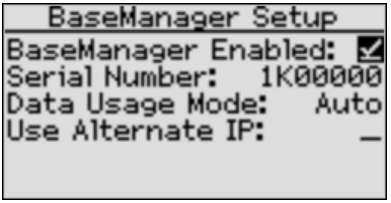
   - **Cell Modem**: Identifies the Baseline part number for the 3G cell modem.
   - **SIM**: The first SIM field displays the unique serial number of the subscriber identity module (SIM) card that is installed in your cell modem. Baseline must activate your SIM card in order for your cell modem to connect. Prior to activation, the second SIM field displays Service Not Authorized.

     The second SIM field and the following line display the registration status of the SIM card.



   - **Signal Quality**: This field displays a number from 1 – 10 that indicates the overall quality of the signal. The higher the number, the better the signal quality.
   - **Signal Strength**: When your modem is connected, this field shows the strength of the connection in dBm and a signal strength meter represented by a series of bars. More bars mean a stronger signal.
     - Excellent = -70 or better
     - Good = -85 or better
     - Fair = -100 or better
     - Poor = worse than -100
   - **Signal to Noise**: This field shows the level of the signal when compared to the level of the background noise. The field also shows a signal to noise meter represented by a series of bars. More bars mean a better signal to noise ratio.
     - Excellent = better than -5
     - Good = better than -9
     - Fair = better than -12
     - Poor = better than -15
     - Very Poor = worse than -15
   - **Network**: This field shows the status of the network connection.
   - **IP ADDR**: This field shows the IP address assigned to the cell modem.
   - **Uptime**: This field shows the number of minutes that the modem has been connected.

4. Press the **Back** button to return to the Network Setup menu and then press the ⇧ or ⇩ button to move to the **BaseManager Setup** option, and then press the **OK** button to select it. The BaseManager Setup screen displays.

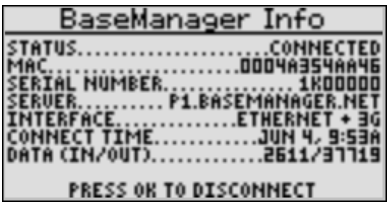


5. Verify that there is a checkmark in the **BaseManager Enabled** field.

6. Press the ⇩ button to move to the **Data Usage Mode** field. Choose one of the following options:

   - **Auto** – Detects the type of communication module that is being used by the controller, and then automatically selects the appropriate mode. If you are using a communication module supplied by Baseline, we recommend that you use the Auto setting.
   - **Normal** – When the controller is connected to a third-party device that is not limited by bandwidth or data plans, set the Data Usage Mode to Normal. In this mode, data is communicated as it happens.
   - **Low** – When the controller is connected to a third-party cell modem, we recommend that you set the Data Usage Mode to Low. This setting restricts the data transfer to once per minute.

7. Press the **Back** button to return to the Network Setup menu and then press the ⇧ or ⇩ button to move to the **BaseManager Info** option, and then press the **OK** button to select it. The BaseManager Info screen displays.



8. Verify that **Connected** displays in the **Status** field and that **Ethernet + 3G** displays in the **Interface** field.

9. The origination date of your connection displays in the **Connect Time** field.

10. The number of bytes received from and sent to BaseManager displays in the **Data (In/Out)** field.

11. Press the **Run** button.

You can add this controller to your BaseManager account using the Admin tool in BaseManager. If you do not have a BaseManager account, call Baseline to set one up.

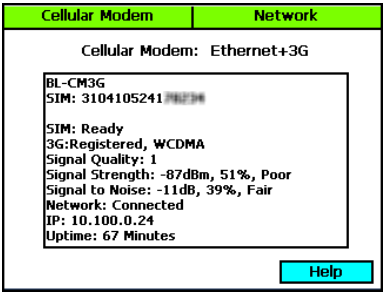
Baseline Support 866.294.5847

BaseStation 3200 V12 Instructions

1. On the BaseStation 3200 V12, turn the dial to the **Network** position.
2. Press the **Next** button to highlight **BaseManager Server Setup**, and then press **Enter**. The BaseManager Settings screen displays. Configure the following fields:
   - **Server URL Mode**: Press the **+** button until **DNS Lookup** displays in the field.
   - **Connection**: Press the **+** button until **Ethernet** displays in the field.

     Note: The Cell Modem option in the Connection field is for an earlier cell modem with a serial connection. For the 3G cell modem that is connected to the controller with an Ethernet cable, you must select Ethernet in the Connection field. After the controller finds the cell modem, the Connection field will automatically update to Ethernet+3G.
3. Press the **Back** button to return to the Network menu.
4. Press the **Next** button to highlight **Cellular Modem**, and then press **Enter**. The Cellular Modem Settings screen displays.
   - **BL-CM3G**: Identifies the Baseline part number for the 3G cell modem.
   - **SIM**: The first SIM field displays the unique serial number of the subscriber identity module (SIM) card that is installed in your cell modem. Baseline must activate your SIM card in order for your cell modem to connect.

     The second SIM field and the following line display the registration status of the SIM card.



   - **Signal Quality**: This field displays a number from 1 – 10 that indicates the overall quality of the signal. The higher the number, the better the signal quality.
   - **Signal Strength**: When your modem is connected, this field shows the strength of the connection in dBm.
     - Excellent = -70 or better
     - Good = -85 or better
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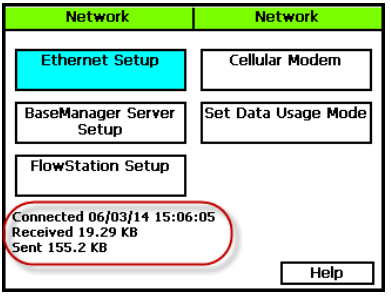
   - **Signal to Noise**: This field shows the level of the signal when compared to the level of the background noise.
     - Excellent = better than -5
     - Good = better than -9
     - Fair = better than -12
     - Poor = better than -15
     - Very Poor = worse than -15

- **Network**: This field shows the status of the network connection.
- **IP**: This field shows the IP address assigned to the cell modem.
- **Uptime**: This field shows the number of minutes that the modem has been connected.



5. Press the **Back** button to return to the **Network** menu.
6. To find the origination date of your connection and see the number of bytes received from and sent to BaseManager, press the **Back** button to return to the **Network** menu. These details display in the lower-left corner of the menu screen.
7. Turn the dial to the **Run** position.

Setting the Data Usage Mode

When a controller is connected to a network, data is transferred back and forth across the network. The transferred data includes information such as network connection status updates, commands sent between the controller and BaseManager, and status updates from the controller to BaseManager.

The BaseStation controller enables you to specify the Data Usage Mode setting. You can choose one of the following options:

- **Auto** – Detects the type of communication module that is being used by the controller, and then automatically selects the appropriate mode. When you are using a communication module supplied by Baseline, we recommend that you set the Data Usage Mode to Auto.
- **Normal** – When the controller is connected to a third-party device that is not limited by bandwidth or data plans, set the Data Usage Mode to Normal. In this mode, data is communicated as it happens.
- **Low** – When the controller is connected to a third-party cell modem, we recommend that you set the Data Usage Mode to Low. This setting restricts the data transfer to once per minute.

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